

FINDINGS OF WATER NET *HYDRODICTYON RETICULATUM* (HYDRODICTYACEAE, CHLOROPHYTA) IN THE CURONIAN LAGOON**Alexandra VOLODINA***, **Marika GERB**The Atlantic Branch of the P.P. Shirshov Institute of Oceanology, RAS Prospekt Mira 1,
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Abstract

Volodina A., Gerb M., 2013: Findings of water net *Hydrodictyon reticulatum* (Hydrodictyaceae, Chlorophyta) in the Curonian Lagoon [Vandentinklis *Hydrodictyon reticulatum* (Hydrodictyaceae, Chlorophyta) Kuršių mariose]. – Bot. Lith., 19(1): 72–74.

Green alga *Hydrodictyon reticulatum* was found for the first time in the Curonian Lagoon in 1936, however, it was still absent in the species lists of the algal flora of the Russian part of the Curonian Lagoon up to date. *H. reticulatum* was found in shallow waters (0.6 m depth) of small bays in the southern (near village Kaširskoe) and south-western (Curonian spit, 1 km to the north of the Tėplyj Bay) coasts of the Curonian Lagoon in June–July 2011. Species was found on the petioles and twigs of submerged aquatic plants *Nuphar lutea*, *Nymphaea candida* and *Ceratophyllum demersum*.

Keywords: Curonian Lagoon, Kaliningrad region, green alga.

The Curonian Lagoon of the Baltic Sea is mainly freshwater hypertrophic water body, which is characterized by strong summer and autumn bloom of cyanobacteria with frequent fish kill in those periods. The average depth of the lagoon is 3.7 m. Flat swamping southern coast is indented by numerous canals and streams. Due to shallowness, the lagoon quickly becomes warm and the temperature reaches 15–18°C in the third decade of May (GASIŪNAS, 1959).

At the Russian part of the Curonian Lagoon, 33 macroalgae species were reported from 1989 to 2001 (SEMENOVA & SMYSLOV, 2005). Although green alga *Hydrodictyon reticulatum* (L.) Bory or the water net was found in the Lithuanian part of the Curonian Lagoon for the first time in 1936 (SCHMIDT-RIES, 1940), it has not been found in the Russian part of the lagoon (SEMENOVA & SMYSLOV, 2005). According to KOSTKEVIČIENĖ & SINKEVIČIENĖ (2008), *H. reticulatum* is rare in Lithuania and has not been found nowadays in the Curonian Lagoon as well.

In June–July 2011, after a long period of time, *H. reticulatum* (Fig. 1, 2) was found in shallow waters (0.6 m depth) of small bays in the southern (near village Kaširskoe, 54° 56' 03" N, 20° 41' 71" E) and south-western (Curonian spit, 1 km to the north of the Tėplyj Bay, 55° 00' 05" N, 20° 35' 95" E) coasts of the Curonian Lagoon (Russian Federation). The algae grew on petioles and twigs of submerged aquatic plants *Nuphar lutea*, *Nymphaea candida* (Nymphaeaceae) and *Ceratophyllum demersum*. However, the water net was not repeatedly found in 2012.

H. reticulatum inhabits freshwaters of the Northern Hemisphere, but it is seldom recorded from the Southern Hemisphere (CHOU et al., 2006). During the last 15–25 years, the water net has occurred, actively spread and has become a nuisance algae in Czech Republic, Great Britain, New Zealand and Taiwan (CHOU et al., 2006; JOHN et al., 1998; LELKOVA & POULIČKOVA, 2004; WELLS & CLAYTON, 1993; HALL & COX, 1995; HALL & PAYNE, 1997). JOHN et al. (1998)

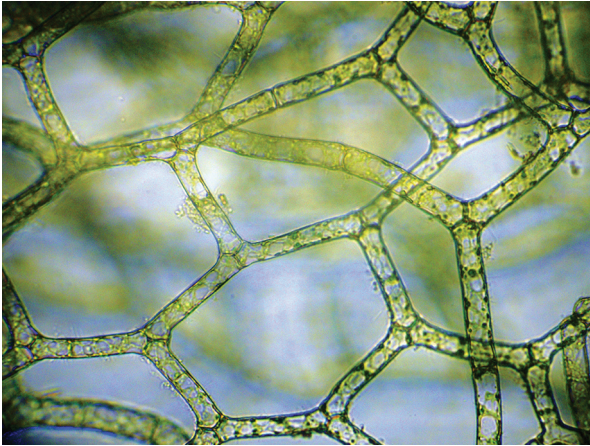


Fig. 1. *Hydrodictyon reticulatum* microview (magnification $\times 300$)



Fig. 2. *Hydrodictyon reticulatum* macroview with the shells of molluscs inside of the net

have assumed that the increase of summer temperatures has much bigger influence on the process of spreading than the nutrient enrichment. Growth of a colony is observed at temperatures of 5–40°C with optimum +25°C (HAWES & SMITH, 1993; HALL & COX, 1995). *H. reticulatum* could tolerate a wide range of temperature (10–35°C), light intensity (300–5300 Lx) as well as nitrogen and phosphorus concentrations (1.0–84.0 mg N·L⁻¹ and 0.05–3.72 mg P·L⁻¹, respectively).

The water net needs a significant amount of nitrogen and prefers eutrophic waters (LELKOVA & POULIČKOVA, 2004). Optimum growth was observed at the concentrations of nitrogen 16.8–50.4 mg L⁻¹ and phosphorus 0.74–2.23 mg L⁻¹ and solar irradiation 25 – \geq 1300 Lx (WANG et al., 1999a, b, c; LELKOVA & POULIČKOVA, 2004). Abundant growth of

Hydrodictyon can produce the increase of water pH and the night oxygen deficiency in shallow waters (LELKOVA & POULIČKOVA, 2004). Also, a mass development of *Hydrodictyon* above the aquatic plants can promote the dying of vegetation and the oxygen deficiency when water net itself is decaying (WELLS & CLAYTON, 2001). Moreover, the *H. reticulatum* metabolites are capable to suppress reproduction of microalgae, thus may diminish the development of e.g. blooms forming *Microcystis aeruginosa* and increase transparency in the water body (FLORY & HAWLEY, 1994; LIU et al., 2004).

It could be predicted a broader further distribution of *H. reticulatum* in the Curonian Lagoon and in adjacent canals because of general spread tendency of alga that probably is related with hypertrophic character of the lagoon, high growth rate of alga, intense fishery activities and the use of different water crafts for the recreation. Due to ecological plasticity of water net, the species share in the macrophyte communities of the Curonian Lagoon possibly will increase. With the assimilation of nitrogen and phosphorus compounds, water net may temporarily increase the water quality. However, annual decomposition of these algae will lead to secondary organic pollution of the water body. Outspread of water net in the lagoon may influence the alterations of macrophyte communities and changes in algae structure.

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VANDENTINKLIS *HYDRODICTYON RETICULATUM* (*HYDRODICTYACEAE*, *CHLOROPHYTA*) KURŠIŲ MARIOSE

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Santrauka

Pirmą kartą vandentinklis *Hydrodictyon reticulatum* Kuršių mariose aptiktas dar 1936 m., tačiau Rusijos Federacijai priklausančioje lagūnos dalyje šie žaliadumbliai rasti tik 2011 m. *H. reticulatum* vystėsi birželio–liepos mėn. nedideliuose, sekliuose (gylis

0,6 m) užutėkiuose pietinėje (prie Kaširskoe gyvenvietės) ir pietvakarinėje (1 km į šiaurę nuo Tjėplyj įlankos) Kuršių marių dalyje. Dumbliai aptikti prisitvirtinę prie pasinėrusių augalų *Nuphar lutea*, *Nymphaea candida* ir *Ceratophyllum demersum* lapalakščių ir šakelių.